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SCIENCE 7

Module 5 Planet Earth

Home Instructor's Guide and Assignment Booklet 5B

Learning Technologies Branch

Alberta LEARNING

Science 7
Module 5: Planet Earth
Home Instructor's Guide and Assignment Booklet 5B
Learning Technologies Branch
ISBN 0-7741-2461-X

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The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Home Instructor's Guide and Assignment Booklet.

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

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Section 3: Fossil Formation and Earth's History

In this section, the student studies how scientists know about Earth's past. He or she looks at fossil formation, fossil fuels, and time on a geological basis.

In Lesson 1 the student studies fossils. He or she finds that there are different types of fossils and is shown how they formed. The student studies paleontology and sees the clues fossils provide.

In Lesson 2 the student examines geologic time. He or she uses superposition as a tool in finding the relative ages of rock layers and learns about radiocarbon dating, radiometric dating, as well as absolute dating. The student then examines the geological time scale and the two early supercontinents.

In Lesson 3 the student extends his or her knowledge of fossil fuels. The student learns about the formation and location of fossil fuels and sees how oil and gas are trapped in rock formations. The student then learns about seismic technology as he or she investigates where to drill for oil and discovers uses for fossil fuels.

The following materials are needed to complete this section.

Section 3: Lesson 1

- 5 Styrofoam® bowls
- spoons
- shells or plastic animals
- graduated cylinder
- plaster of Paris
- sand
- clay
- pebbles
- water

Section 3: Lesson 2

- scissors
- adding machine tape
- metre-stick (or ruler)
- pencil
- coloured pencils

Section 3: Lesson 3

- coloured pencils
- glue
- scissors

Suggested Answers

Section 3: Lesson 1

3. a. **Textbook questions 1, 2, and 3 of "Analyze," p. 421**

1. The manipulated variable was the different types of mixtures used for the moulds. The responding variable was the quality of mould and cast.

2. Answers will vary. Usually the best moulds are those made of clay and sand. The poorest moulds are those made with pebbles. The smaller the particles making up the mould, the closer the mould represents the object.

3. Overnight, the clay became harder, water evaporated somewhat from the other mixtures, and the plaster of Paris hardened.

b. **Textbook question 4 of "Conclude and Apply," p. 421**

4. Placing the object and mixture into the bowl at the same time would have made it very difficult to remove the object without destroying the mould.

Section 3: Review

1. **Textbook question 1 of "Reviewing Key Terms," p. 433**

1. a. On the geologic time scale, Cenezoic is an **era** and Cambrian is a **period**.

b. **Fossil** fuels include oil, natural gas, and coal.

c. The earliest supercontinent was called **Rodinia**.

d. An **index** fossil can be used to determine the relative age of strata.

e. A **mould** is a cavity in rock left when hard parts of an organism dissolve. A **cast** is produced when sediments fill in the cavity.

f. A woolly mammoth found preserved in the ice is an example of **original** remains.

g. Layers of rock are also called **strata**.

h. A dinosaur footprint is an example of a **trace** fossil.

i. Relative, radiometric, and radiocarbon **dating** provide information about the age of the strata.

M K H Q E N I M E R S C
U V E N G Z Q C O T B A
O R I G I N A L R U S S
A N M G P R G A U R L T
E U W E T L T A H O V D
M H S G S A N S E D G U
G L R Y V O J W E I N V
D O I R E P Z I G N I G
V V K S B I H O R I T N
G N D V S M V N I A A E
I N D E X O H F H C D K
E Y E Q Y I F X A E R D

2. **Textbook questions 3, 4, and 5 of "Understanding Key Concepts," p. 433**

3. Most organisms are destroyed shortly after they die, thus there are no remains that can be fossilized. To become a fossil, remains must be buried quickly to prevent decay.

4. Radiometric dating of rocks can be used to establish their absolute age. Determining the age of meteorites in this manner allows geologists to calculate the age of Earth because meteorites were formed at the same time as Earth.

5. Fossil fuels are formed from the soft remains of animals and plants that have been subjected to high heat and great pressure over millions of years. Another theory proposes that fossil fuels were trapped in the interior of the planet during its formation and have been migrating to the surface since.

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ASSIGNMENT BOOKLET 5B

Science 7
Module 5: Section 3 Assignment and Final Module Assignment

Home Instructor's and Student's Comments:

STUDENT FILE NUMBER
(if label is missing or incorrect)

Date Submitted:

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for correct course and module.

FOR SCHOOL USE ONLY

Assigned Teacher:

Date Assignment Received:

Grading:

Teacher's Comments

Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

INSTRUCTIONS FOR SENDING IN THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

FAXING

1. Assignment Booklets may be faxed. Contact your teacher for the fax number.

2. All faxing costs are the responsibility of the sender.

E-MAILING

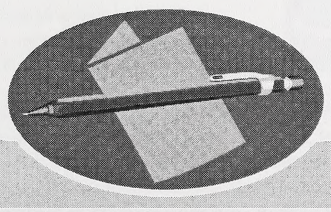
Assignment Booklets may be e-mailed. Contact your teacher for the e-mail address.

Science 7

Module 5

Planet Earth

Assignment Booklet 5B



Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 3 Assignment	26	
Final Module Assignment	26	
	52	

Teacher's Comments

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Module 5: Planet Earth
Assignment Booklet 5B
Learning Technologies Branch

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ASSIGNMENT BOOKLET 5B
SCIENCE 7: MODULE 5
SECTION 3 ASSIGNMENT AND FINAL MODULE ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 52 marks out of the total 109 marks for the assignments in Module 5. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(26)

Section 3 Assignment: Fossil Formation and Earth's History

Read all parts of your assignment carefully and record your answers in the appropriate places.

(3) 1. Complete the following chart using the items in the list given. Write each the item in its proper place in the chart.

- bones
- brain
- hair
- muscle
- skin
- teeth

Body Parts and Fossils	
Likely Seen in a Fossil	**Unlikely Seen in a Fossil**

(1) 2. There are several kinds of fossils. Some preserve parts of the organism. A _____ fossil shows signs of animal activity.

(3)

3. On a hike through a river valley, you find a rock that looks remarkably like a piece off a tree trunk. Explain the process of fossilization that produced this specimen.

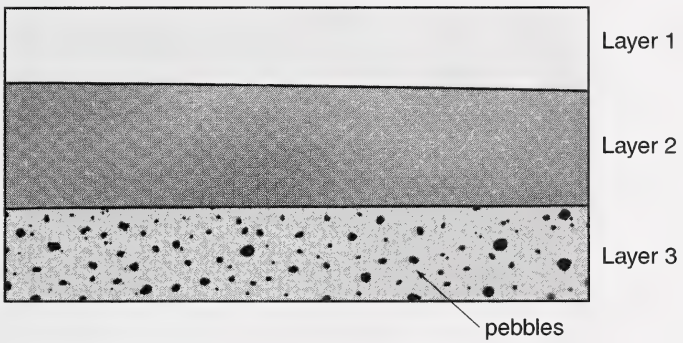
Return to page 82 of the Student Module Booklet and begin Lesson 2.

(4)

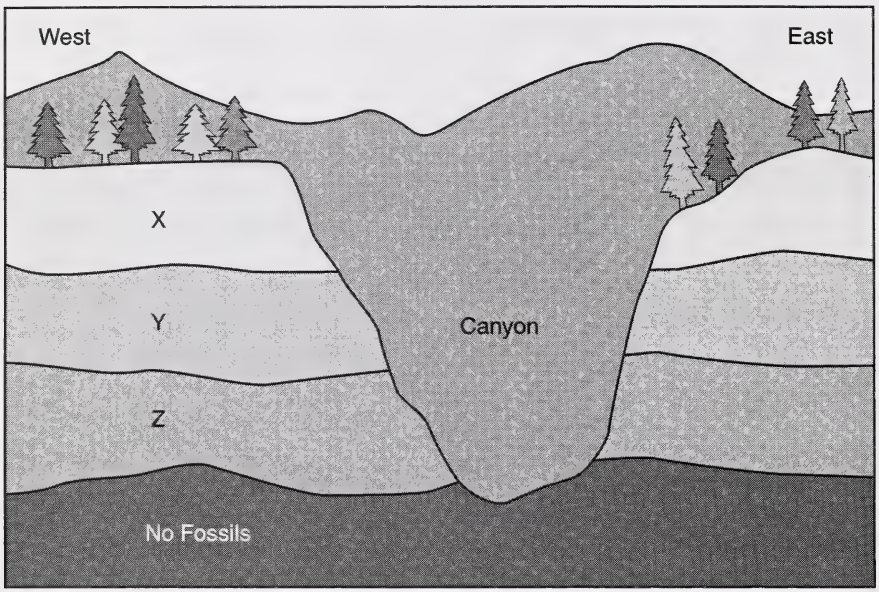
4. One method of radiometric dating is to use the potassium-40 to argon-40 method. Potassium-40 has a half-life of approximately 1.3 billion years. Approximately how much of the parent material that existed when Earth was formed remains today?

(5)

5. The following diagram illustrates a small section of rock strata. List the components of the strata (including the pebbles) in order of age from oldest to youngest. Which principle are you using to answer this question?



6. You are part of a paleontology expedition. Your group comes upon the canyon illustrated in the following diagram. Hiking down the cliff on the west side, fossils X, Y, and Z are found (as indicated in sedimentary rock). No fossils are found at the bottom of the valley.



(1) a. Your group leader asks you to predict if you will find fossils in the east cliff. If so, in what order will you find them?

_____

_____

_____

(1) b. Given the lack of fossils in the bottom layer, can you estimate when it might have been deposited?

_____

_____

_____

(3) c. Upon closer examination, fossil X is of a fur-bearing mammal, fossil Y is of a fish, and fossil Z is of a sea shell. It is confirmed that there is no fossil evidence in the bottom layer. What do these fossils indicate about the environmental and climatic conditions in this area?

Return to page 88 of the Student Module Booklet and begin Lesson 3.

(1) 7. Petroleum and coal are examples of _____ fuels.

(2) 8. There are several theories about the source of fossil fuels. One says that they come from the remains of ancient organisms. How do the sources of coal and oil differ according to this theory?

(2) 9. Would it be unusual to find sandstone immediately above a natural gas pool? Why?

Return to page 91 of the Student Module Booklet and begin the Section 3 Review.

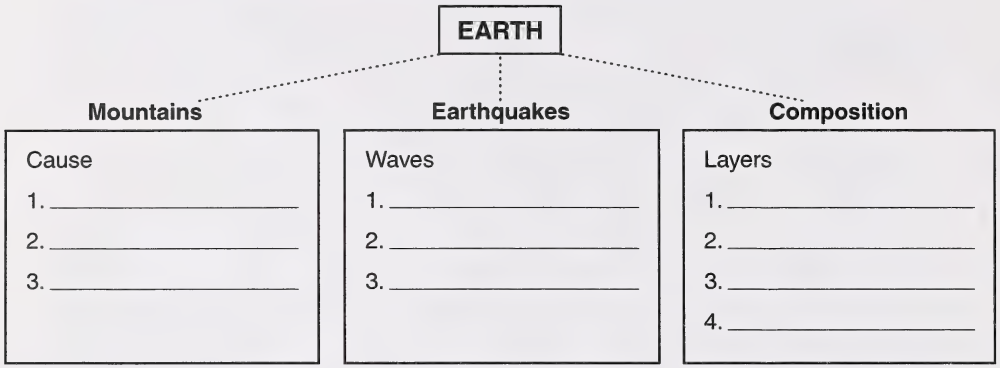
26

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places.

5

1. Complete the following concept map about Earth and its crust.



3

2. You've just come in from a long walk on a hot summer day, so you get a glass of cold water. You find two mineral samples on your desk. As you are drinking the water and opening a letter from a friend with the steel letter opener, you try to figure out what the mineral samples are. The note on the samples says they are quartz and calcite. Name two ways you can find out which mineral is which using only the materials at hand.

_____

_____

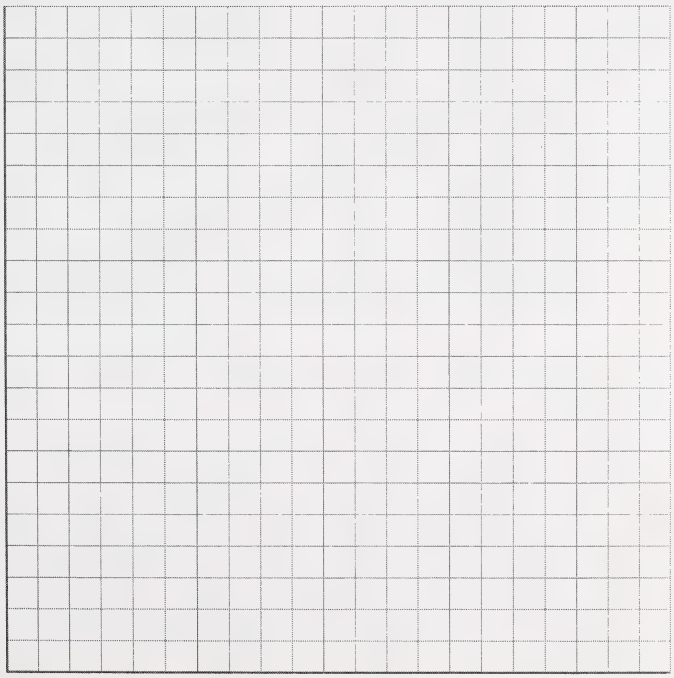
_____

3. Many historic buildings have facings made of limestone or marble. These materials are easily damaged by acid rain. In a nearly unpolluted area, a limestone facing erodes at a rate of 1 mm every 100 years. In a heavily polluted area, it erodes at a rate of 1 mm every 5 years.

(3) a. Complete the following table.

Unpolluted Area		Polluted Area	
Number of Years	**Remaining Limestone (mm)**	**Number of Years**	**Remaining Limestone (mm)**
0	200	0	200
50		50	
100		100	
200		200	
500	195	500	100

(5) b. Graph the data in the table. Extend the graphs to show how much of the facing would be left after 1000 years for each area.

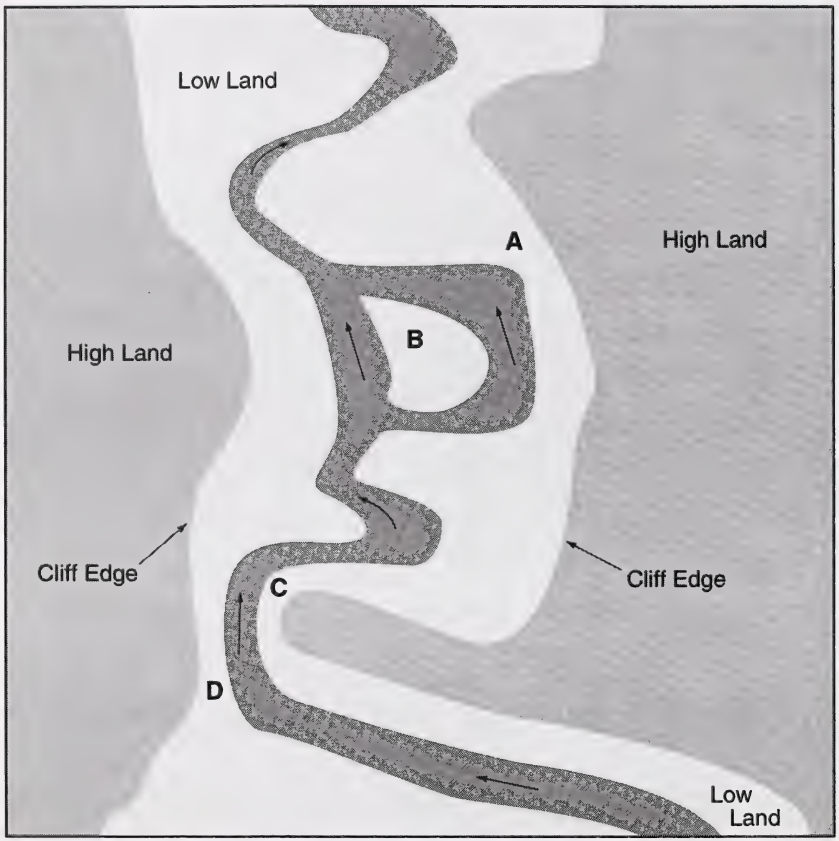


(2) c. How much facing is left after 1000 years in both areas?

_____

_____

(1) _____ 4. Refer to the following diagram. The direction of water flow is shown by the arrows. Where would you expect the cliffs to fall into the river? (Place your answer in the blank space given.)



(3) 5. List three geologic features geologist look for in search of an oil pool. Explain why these are important features.

_____

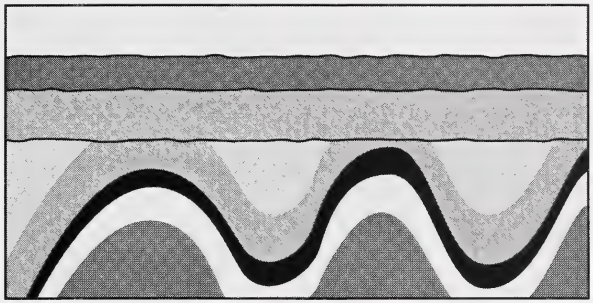
_____

_____

_____

(4)

6. Describe, in detail, the geologic history of the following sample strata.



Submit your completed Assignment Booklet 5B to your teacher for assessment.

ASSIGNMENT BOOKLET DECLARATIONS

The Student's Declaration is to be signed by a student registered at the Alberta Distance Learning Centre. If the student is under 16, the Supervisor's Declaration is to be signed by the student's supervisor, who is usually a home instructor, teacher, or home-schooling coordinator. Failure to complete this page may invalidate the assignment results.

STUDENT'S DECLARATION

- I have followed the instructions outlined in the Student Module Booklet.
- I have completed the activities to prepare myself for the assignments in this Assignment Booklet.
- I completed the assignments in this Assignment Booklet by myself.

_____

Student's Signature

SUPERVISOR'S DECLARATION

I hereby certify that I have supervised the learning activities completed by _____.

Student's Name

I also certify that to the best of my knowledge the assignments in this Assignment Booklet were completed independently by this student.

_____

Supervisor's Signature

If you, the student or supervisor, have any comments or observations regarding this module, write them in the following space.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

COURSE SURVEY FOR SCIENCE 7
(© 2003)

After you have completed the assignments in this course, please fill out this questionnaire and mail it to the address given on the last page. This course is designed in a new distance learning format, so we are interested in your responses. Your constructive comments will be greatly appreciated, as future course revisions can then incorporate any necessary improvements.

Name _____ Age ❑ under 19 ❑ 19 to 40 ❑ over 40

Address _____ File No. _____

_____ Date _____

_____

Design

1. This course contains a series of Student Module Booklets. Do you like the idea of separate booklets?

_____

_____

2. Have you ever enrolled in a correspondence or distance learning course that arrived as one large volume?

❑ Yes ❑ No If yes, which style do you prefer?

_____

_____

3. The Student Module Booklets contain a variety of self-assessed activities. Did you find it helpful to be able to check your work and have immediate feedback?

❑ Yes ❑ No If yes, explain.

_____

_____

4. Were the questions and directions easy to understand?

❑ Yes ❑ No If no, explain.

_____

_____

5. The course material may contain some enrichment or extra help activities. Did you find these activities beneficial?

❑ Yes ❑ No If no, explain.

_____

_____

6. Did you understand what was expected in the Assignment Booklets?

❑ Yes ❑ No If no, explain.

_____

_____

7. The course materials were designed to be completed by students working independently at a distance. Were you always aware of what you had to do?

❑ Yes ❑ No If no, provide details.

_____

_____

8. This distance learning course may include an assortment of drawings, photographs, and charts.

   a. Did you find the visuals in this course helpful?

   ❑ Yes ❑ No Comment on the lines below.

   _____

   _____

   b. Did you find the variety of visuals in this course motivating?

   ❑ Yes ❑ No Comment on the lines below.

   _____

   _____

9. Some activities may have called for the use of an audiocassette, videocassette, or CD. Did you use these forms of media?

   ❑ Yes ❑ No Comment on the lines below.

   _____

   _____

10. The Student Module Booklet may have directed you to work with your teacher. How well did you work as a team?

    Student's comments: _____

    _____

    _____

    _____

    Teacher's comments: _____

    _____

    _____

    _____

Course Content

1. Was enough detailed information provided to help you learn the expected skills and objectives?

   ❑ Yes ❑ No Comment on the lines below.

   _____

   _____

2. Did you find the workload reasonable?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

3. Did you have any difficulty with the reading level?

❑ Yes ❑ No Please comment.

_____

_____

4. How would you assess your general reading level?

❑ poor reader ❑ average reader ❑ good reader

5. Was the material presented clearly and with sufficient depth?

❑ Yes ❑ No If no, explain.

_____

_____

General

1. What did you like least about the course?

_____

_____

2. What did you like most about the course?

_____

_____

Additional Comments

_____

_____

_____

_____

_____

_____

_____

Only students enrolled with the Alberta Distance Learning Centre need to complete the remaining questions.

1. Did you contact the Alberta Distance Learning Centre for help or information while doing your course?

   ❑ Yes ❑ No If yes, approximately how many times? _____

   Did you find the staff helpful?

   ❑ Yes ❑ No If no, explain.

   _____

   _____

2. Were you able to fax any of your assignment response pages?

   ❑ Yes ❑ No If yes, comment on the value of being able to do this.

   _____

   _____

3. If you mailed your assignment response pages, how long did it take for their return?

   _____

   _____

4. Was the feedback you received from your correspondence or distance learning teacher helpful?

   ❑ Yes ❑ No Please comment.

   _____

   _____

   _____

   _____

Thanks for taking the time to complete this questionnaire. Your feedback is important to us. Please return this questionnaire to the address on the right.

If you are enrolled at the Alberta Distance Learning Centre and will be mailing your Assignment Booklets to ADLC, you may return this questionnaire with the final Assignment Booklet in the course.

Learning Technologies Branch
Box 4000
Barrhead, Alberta
T7N 1P4

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